South Dakota AFNR

Academic Integration Activities: Example #7

→ *Agribusiness Entrepreneurship students apply algebraic equations to livestock market prices.*

1. Ag Standard

Agribusiness Entrepreneurship—E.3.1
Students use strategies for optimum marketing of agricultural commodities.

2. Academic Standard

9-12.A.2.1
Students are able to use algebraic properties to transform multi-step, single-variable, first-degree equations.

3. Background Information

Order of operations: When performing algebraic equations, a certain order of mathematical operations should be followed. Use the acronym shown here to remember the order and work left to right.

> PEMDAS (Please Excuse My Dear Aunt Sally)
> Parenthesis—Exponents—Multiply—Divide—Add—Subtract

4. Example in Context

A rancher sells 43 head of calves, each weighing an average of 634 lbs. His check (before charges were subtracted) was $28,625. How much did the calves bring per pound?

28,625 = (634 * 43)x

x = $1.05

Review order of operations: PEMDAS
Determine what x means: x is the dollar amount per pound.

Calculate inside of parenthesis first.
634 * 43 = 27,262

Substitute that number.
28,625 = 27,262x

Divide on both sides to find X.
$\frac{28,625}{27,262} = \frac{27,262x}{27,262}$

1.05 = x

Answer: x = $1.05 per pound

5. Guided Practice Exercise

A rancher wants to sell two loads of calves. The first bunch of 13 calves averages 524 lbs, and the second bunch of 17 averages 648 pounds. He gets two checks – one for each bunch. The smaller herd brings $1.09 per pound; the larger bunch brings $1.04 per pound. There is $15 per calf deducted for various charges, including commission, beef check-off, vet services, etc. How much does he make total?

1.04 * 524 * 13 + 1.09 * 648 * 17 – 15 (13 + 17) = x

Review order of operations: PEMDAS
Determine what x means: x is dollar amount the rancher receives.

Calculate inside of parenthesis first, working left to right.
13 + 17 = 30

Substitute those numbers into the equation.
1.04 * 524 * 13 + 1.09 * 648 * 17 – 15 (30) = x

Multiply, working left to right.
1.04 * 524 * 13 = 7,084.48
1.09 * 648 * 17 = 12,007.44
15 * 30 = 450

Substitute those numbers into the equation.
7,084.48 + 12,007.44 – 450 = x

Add, and then subtract, working left to right.
7,084.48 + 12,007.44 – 450 = 18,641.92

x = 18,641.92

Answer: The rancher's check is $18,641.92

6. Independent Practice Exercises

A rancher decides to sell his calves. The 55 head of steers average 622 lbs, and 59 heifers average 601 lbs. Both bunches bring $1.11. He wants to average out four head for his son. How much does his son make?

$$\left\{ \frac{1.11\,(55 * 622 + 59 * 601)}{(55 + 59)} \right\} * 4 =$$

Answer: The son makes $2, 713.42.

A rancher sells 17 head of calves. They bring $1.03. His check (before charges were subtracted) was $9,928.17. How much did the calves weigh on average?

9,928.17 = (17 * 1.03)x

Answer: x= 567 lbs average weight

7. Notes

Word problems and algebraic equations could be created for other agricultural commodities, such as corn, soybeans, or wheat.

These calculations also could be taught in an animal science course.